

Downlink Signal Processing in CDMA Systems Utilizing Arrays of AntennaeABSTRACT

5        The present invention is a method for operating a first base station (BS) in a cellular communication system that includes a plurality of BSs for transmitting information to a subscriber unit (SU). The information is included in a downlink signal sent from the first BS to the SU. The first BS includes an array of antennae that is used to send the downlink signal to the SU. Each antenna is coupled to a signal processing circuit that generates an antenna  
10      signal for that antenna by processing the downlink signal. The processing depends on a weight set that is utilized in generating individual signals to be sent on individual antennae in the array of antennae. The weight set depends on the location of said SU relative to said array of antennae. The cellular system includes at least one protocol in which the SU generates a report signal indicative of the signal strength detected by the SU when the first BS transmits a  
15      pilot downlink signal. The method of the present invention determines the weight set to be used in communicating with the SU by transmitting a plurality of pilot downlink signals from the BU to the SU, each pilot downlink signal being processed with a different weight set than that used to process the other pilot downlink signals. The report signals received for each of the pilot downlink signals are compared to determine which weight set should be utilized to communicate in the downlink direction. The method of the present invention can be practiced  
20      within existing CDMA cellular standards such as the IS-95 standard.